dehisce, and spores germinate in the closed sporangia. As a result, dwarf male prothallia are produced, antheridia sometimes appearing at the three- or four-celled stage. Free spores under the same conditions never produce such prothallia, not having developed sexual organs at the conclusion of the experiment. The dwarf males do not burst through the wall of the sporangium, and ultimately die. It was found also that both free spores and those inclosed in sporangia germinate in darkness. The suggested explanation of the formation of the dwarf male prothallia under the conditions described has no foundation in experimental work. It is to be hoped that the day of imaginary "explanations" is about over.—J. M. C.

Periodicity of algae.—BROWN[29] has studied the appearance and disappearance of algae in selected ponds and streams in the vicinity of Bloomington, Indiana. In this region, an alga growing under "steady normal conditions" remains in a healthy vegetative state throughout the year. A sudden change in external conditions checks this vegetative growth, and induces a resting stage or sexual reproduction. In reference to specific plants, *Spirogyra nitida* is the most abundant of the Conjugatae in the region studied, and *S. varians* is the most widely distributed alga, conjugating at all seasons of the year when exposed to hard conditions (as the drying-up of a pond); Chaetophora thrives best in slightly stagnant water at a temperature between 5° and 25° C.; Draparnaldia finds its most congenial conditions in flowing surface water between 1° and 15° C.—J. M. C.

Cytology of Synchytrium.—GRIGGS[30] has continued an investigation on *S. decipiens* begun by F. L. STEVENS, to whom he is indebted for material. There are 500 to 800 free nuclei in the cyst when cell walls begin to appear; but most of the study was upon cysts with 100 to 300 free nuclei. While no centrosomes were found in the metaphase and anaphase, in the telophase there are large asters with centrosomes at the center, whose origin has not yet been determined. As the nuclear vacuole forms about the chromosomes, the coarse rays of the aster bend about it and become transformed into the thick nuclear membrane characteristic of the genus. It is hoped that a further study will throw some light upon systematic relations.—CHARLES J. CHAMBERLAIN.

Sporangia of Lycopodiaceae.—As a result of her study of the sporangium-bearing organs of the Lycopodiaceae, Miss SYKES[31] has arranged the different species of Lycopodium in a continuous series based on the shape and structure of the sporophyll, the position of the sporangium, and the position of the line of dehiscence. The evidence adduced seems scarcely sufficient to warrant the con-

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[29] BROWN, HARRY B., Algal periodicity in certain ponds and streams. Bull. Torr Bot. Club **35**:223–248. 1908.

[30] GRIGGS, ROBT. F., On the cytology of Synchytrium. Ohio Naturalist **8**:277–286. *pl. 20.* 1908.

[31] SYKES, M. G., Notes on the morphology of the sporangium-bearing organs of the Lycopodiaceae. New Phytol. **7**:41–60. *pls. 2, 3.* 1908.

clusion that the genus Lycopodium should be interpreted as a reduction series, or to afford a basis for the supposition that the sporangium-bearing organ of the Lycopodiaceae has been "derived from a branch structure which had the morphological value of an axillary bud."—ALMA G. STOKEY.

Embryo and endosperm of Potamogeton.—COOK[32] has investigated material of *P. lucens* obtained from Cuba. The embryo was found to resemble closely that of Alisma in its development. In endosperm formation a transverse wall chambers the sac at the first division; in the micropylar chamber the endosperm formation proceeds as a series of free nuclear divisions, usually with parietal placing; the antipodal chamber develops as a haustorial extension of the sac into the chalaza, and during this development the second daughter nucleus of the primary endosperm nucleus seems to be very active, but does not divide.—J. M. C.

Ophioglossum simplex.—This rare Sumatran species has been collected again, and these new specimens show to BOWER[33] an outgrowth which, evidently single, represents a sterile blade, of which there was no such indication in the specimen he had examined previously. The fact is important because of the difference of opinion as to the phylogenetic position of Ophioglossum. CAMPBELL has regarded *O. simplex* as the most primitive known member of the genus, while BOWER has claimed it to be a reduction form. The evidence just reported would seem to justify the latter contention.—J. M. C.

Anthocyan and chlorophyll.—An interesting bit on the function of anthocyan is the observation by MOLÉR[34] that the red leaves of a species uniformly contain less chlorophyll than the green leaves. The ratio runs between 1.08 and 1.27. This seems to be difficult to reconcile with TISCHLER's hypothesis that anthocyan enables the plant to nourish itself better and so to stand a more severe climate. —C. R. B.

Radioactivity.—ACQUA reports[35] that salts of uranium and thorium, even in very dilute solutions, injure seedlings of wheat by reducing the development of the primary root. Germination was also retarded. His experiments supplement those on radium and other radioactive substances by other investigators.—C. R. B.

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[32] COOK, MELVILLE THURSTON, The development of the embryo sac and embryo of *Potamogeton lucens*. Bull. Torr. Bot. Club **35**: 209–218. *pls. 9, 10*. 1908.

[33] BOWER, F. O., Note on *Ophioglossum simplex* Ridley. Annals of Botany **22**: 327, 328. 1908.

[34] MOLÉR, T., Ueber den Chlorophyllgehalt anthocyanführender Blätter (Vorläufige Mitteilung). Bot. Notiser **1908**: 49–53. 1908.

[35] ACQUA, C., Sull'azione dei sali radioattivi di uranio e di torio nella vegetazione. Annali di Botanica **6**: 387–401. 1908.